

Andrew Malcolm and C D Purdon Pioneers of occupational medicine in Belfast

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Fifty-one years ago half-a-dozen doctors employed in industry met in London and formed an association — now the Society of Occupational Medicine. Ten years ago the Royal College of Physicians in Ireland brought into existence the first faculty of occupational medicine in Europe followed two years later by the London College. The first textbook on occupational diseases was published in 1700 in Italy by Ramazzini¹ but it was not until 1832 that Thackrah² in Leeds distilled his vast experience and knowledge in a series of fascinating chapters on a variety of conditions attributable to occupations and for which he recommended preventive measures. These men and others gained their experience from observation in the ordinary practice of medicine. It was only after 1802 that doctors had any formal or legal responsibilities in the sphere of industry. After the passing in that year of the Health and Morals of Apprentices Act (which we now regard as the first Factory Act), the need for the advice of doctors became apparent, for one of its provisions was that no child under the age of ten years might be employed in the mills. At that time, because of increasing mechanisation which allowed operations to fall within the physical capacity of children, there was much adult unemployment. Consequently many parents driven by poverty overstated the age of their little ones in order that the family might escape the consequences of the harsh Poor Law of the time. Baptismal certificates were not always available and often did not refer to the youngster presented for employment. Registration of births and deaths did not come into operation until 1837 (later in Ireland) so some method of ascertaining the age and enforcing the Act had to be found. The 1802 Act had established the principle of factory inspection — resisted by the employers holding the *laissez-faire* philosophy of the times, and initially the inspectors were appointed on a local basis by the district magistrates.

These inspectors (of whom one had to be a magistrate and another the vicar or rector of the parish) invited local medical men to certify the apparent age of the children. For reasons which do us no credit the system fell into disrepute.³ In 1819 another Act was passed which provided for the appointment of four paid inspectors with responsibility for Great Britain and Ireland, but it reduced the childhood age to nine. These inspectors were empowered to appoint medical practitioners to certify the apparent age of the child. Two problems thus arose — whom to appoint, for the status of qualified and registered practitioners did not become precise until after the Medical Act 1858, and how objectively to determine the age of children. On both these topics a correspondence of great virulence appeared in the medical press. Apothecaries, surgeons and physicians

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all claimed the appointments, and a multiplicity of opinions on the determination of age by weight, height, appearance and other evidence enlivened the journals of the day.

The inspectors however, were men of learning and probity — the man whose bailiwick included the north of Ireland (which at that time was north of a line from Dublin to Galway) was Leonard Horner. He was of a distinguished Scottish family and a polymath with interests in chemistry, geology and other natural sciences, subsequently becoming a Fellow of the Royal Society and one of the founders of London University. Another inspector was Robert Saunders, who, although non-medical, entered the controversy by publishing a monograph on the usefulness of the dentition in determining age.⁴ Horner concurred with his conclusions — 'I am becoming rather knowing in that I have looked into 500 little mouths lately. I suppose it has got wind, for when the doctors and I go round the mills and call any to us who look too young . . . they sometimes come running with their mouths open and turn up their little heads without being told'.⁵ Thus was formed the certifying factory surgeon system by which medical men assumed a formal degree of responsibility for some of the human problems arising in industry.

It was for one of these appointments that in 1849 Dr Andrew G Malcolm (1818-1856) unsuccessfully applied to James Stuart, who in a reorganisation of districts had succeeded Horner. That the position of Certifying Factory Surgeon had by this time achieved some esteem in the minds of the profession may be gauged by the fact that in 1854 when the post again became vacant 'six of the eight members of the honorary medical staff of the General Hospital applied, Malcolm himself being the senior attending physician'.⁶ Calwell suggests that on this occasion Malcolm was successful and there appears to be confirmation of this in his lecture to the British Association in 1855 when in reference to his researches into the influence of factory life on the health of the operatives he spoke of 'experience in my public appointment . . . I personally inspected the workers at the factories . . .'⁷

By the eighteenth century Europe had well and truly cast off the bonds of mediaevalism and by the beginning of the nineteenth century the great period of differential diagnosis and clinical description of syndromes was flourishing. The application of statistical methods to medical data as distinguished from vital statistics had been made by Pierre-Charles Alexandre Louis⁸ in his works on tuberculosis (1825) and typhoid (1829), and in 1835 his statistical proof that



Fig 1. Andrew G Malcolm (1818-1856) (from *Andrew Malcolm of Belfast*, by H G Calwell, reproduced with the author's permission).

blood letting was of little value in the treatment of pneumonia, heralded the dawn of medical statistics. Although Belfast at the time was the scene of growing sectarian tensions and great industrial and social upheavals, there was also throughout the country a great humanitarian movement and Calwell has graphically described Malcolm's leading part in it. In the midst of all his frenetic activity, Malcolm led the profession not only by the introduction of new teaching methods but by the adoption of precise methods of enquiry and rational analysis of the material obtained by assiduous effort rather than by anecdotal evidence. He was part of the intellectual activity of the time and a leader amongst his peers.

Living at 29 York Street, between the hospital and Mulholland's Mill, it was almost inevitable that Malcolm's interest in the effects of flax dust on 'operatives' would be stimulated, and his modern approach to medical enquiry is shown in the reading of his paper — not to a medical group but to a meeting of the statistical section of the British Association in Glasgow in 1855.⁹ With his friend Professor Hodges he examined microscopically the filaments of flax, noted in detail their structure and estimated the content of the ash. He described in detail the various processes through which flax was passed, the relative amounts of dust generated in each department, the temperature and humidity of the workrooms and the working position of each of the operatives. He thus demonstrated the *sine qua non* of a good occupational health physician — he knew the processes and the environment in which they were carried out. He had travelled to Leeds — then the centre of the linen trade in England — visited the great Marshall's Mills (the ventilation system of which he was critical) and, because of Thackrah's association with the trade there, it is probable that Malcolm met him and had read his book.

The evidence for Malcolm's paper came from three different sources — the returns of attendances and the causes thereof from six dispensary districts in Belfast for the years 1852-55 as well as the occupations of the patients, similar returns from the General Hospital between 1848 and 1854, and the visitation of '2,078 workers to whom queries were submitted and indiscriminately visited at their homes'.¹⁰ One could not do justice to the assiduity with which these researches were pursued nor to the meticulous analysis of the data without reading the actual paper. Not only did he identify the pernicious effects of flax dust and demonstrate that the amount of disability was related to the amount of dust in the workroom but he made recommendations designed to improve the working environment. In these he anticipated at least two of Legge's axioms^{11, 12} when he advocated the extraction of dust at its site of origin and wrote that 'the freest change of atmosphere should not be subject to the control or whim of the operator'.

While Malcolm was engaged in his multifarious activities, Dr Thomas Henry Purdon (1806-1886) was medical attendant at the Institution set up by the Belfast Charitable Society. (He was the second of a succession of the Purdon family connected with the Society from about 1800 until the death of Dr E B Purdon in 1947). In 1846-47 this institution agreed to accept non-infectious cases from the General Hospital during an outbreak of typhus on the emigrant ship Swatara¹³ and it was arranged that those transferred patients would be attended by the hospital physicians, of whom Malcolm was one. As a result Dr Charles Delacherois Purdon (1818-1882) who had succeeded his brother as medical attendant at the Institution, for a period at least, would have worked with Malcolm. At that time linen manufacture was a domestic industry and the Board of the Society had made provision for spinning to be carried out on their premises.



Fig 2. Charles D Purdon (1818-1882) (from the portrait as President of the Ulster Medical Society 1874).

Strain¹⁴ writes 'as early as May 1775 the spinning of flax by inmates must have reached considerable proportions'. It may be that in his association with Malcolm and his experience in the Institution, Purdon's interest in the textile trade was excited. He later became a certifying factory surgeon, and in 1873 read a paper to the annual meeting of the Certifying Factory Surgeons in Leeds — 'The mortality of flax mill and factory workers'.¹⁵ He set out a series of tables 'classified according to age, employment, whether flax mill and factory classes, artizan and labouring classes, gentry and mercantile classes and nature of diseases'. He showed the excess of mortality from respiratory disease among the operatives, especially those in the preparing rooms. He observed 'the reason that the machine boys appear to suffer so little is that when they become "poucey" (i.e. asthmatic) caused by flax

dust, numbers of them leave the mills and go to other trades' ('poucey' is a degradation of the French word for dust). His description of the paroxysms of dyspnoea and coughing show how distressing they must have been.

But it was not only with respiratory disease that Purdon was concerned — he attributed many accidents to vertigo and fainting resulting in falls into machinery. He noted a number of common conditions — anaemia, oedema of the ankles, varicose veins and others. His description of mill fever is precise: 'This comes on when they are a few days engaged at work. The symptoms are rigors, nausea and vomiting, speedily followed by pain in the head, thirst, heat of the skin etc. This state continues from two to eight days, when the disease subsides of itself'. Although Purdon's observations are concerned mainly with the respiratory system, they were not confined to it. He draws attention to 'a peculiar eruption which attacks the uncovered parts of the body, this I call "lichen". I have never seen an adult affected with it'. (The Purdon family were all interested in diseases of the skin and C D Purdon in 1865 founded a skin hospital which is now an integral part of the Royal Victoria Hospital).¹⁶ Not content with drawing attention to the results of his enquiries, Purdon proceeded to propose a series of measures which in his view would 'mitigate the mortality'. These included modifications of the half-time system, — selection of the more robust and older children for the dustier jobs, thorough ventilation, the compulsory use of respirators and the 'quarterly inspection', not only of the children but also of the lodging houses.

Two years later in Edinburgh, Purdon was discussing 'The longevity of flax mill and factory operatives'.¹⁷ In this paper he thanks the proprietors for their co-operation in his researches and demonstrated that in the country mills the longevity of workers is greater and their ability to work 'longer' than in town mills. In 1877 he published *The sanitary state of the Belfast factory district 1864-73*.¹⁸ This communication uses much of the previous material and describes in much

more graphic detail the appalling conditions not only in the mills but in the homes of the 'working classes'. He mentions that recruiting sergeants were forbidden by army surgeons to enlist men who had been employed as dressers because of their affected lungs. What is perhaps of most interest to us as clinicians is his observation about spinners: 'On each Monday morning after being in for a short time, many of them become so faint and giddy that they are obliged to go out into the lobbies in order to recover themselves'. This appears to be the earliest report of the Monday morning syndrome of byssinosis.

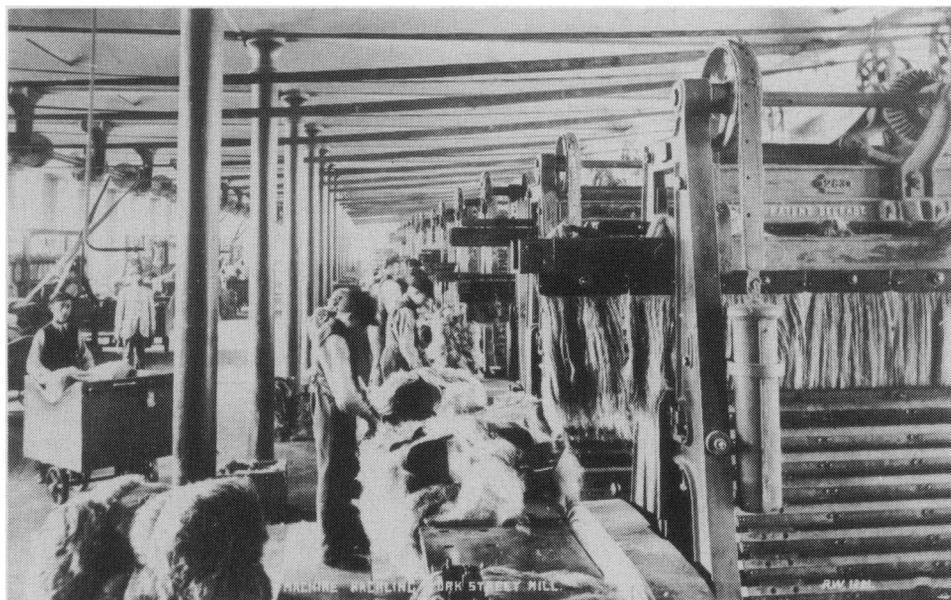


Fig 3. The hackling room, York Street Mill, early 20th century.
(reproduced by permission of the Ulster Museum).

Not only is this paper informative and descriptive of working conditions and the results of working in them, it has attached a number of letters and reports from colleagues and others which indicate the assiduity with which he conducted his enquiries. There is a letter from an employer which concludes: 'We consider that visits of a medical man to all manufacturers like this, is most decidedly to the advantage of both workers and employers'. There is a report from Professor Hodges who recommended a different dressing for the yarn which would dry out at a lower temperature. A section on the early decay of permanent teeth, improper and insufficient nourishment (bread and tea), the use of opium, chewing and smoking tobacco, drunkenness and the causes thereof, follow. A reference is made about the mode of life and the effects of a change of diet as well as the use and abuse of athletic pursuits.

In an appendix Dr D Hamilton, a certifying factory surgeon in Cookstown, gives graphic and horrifying descriptions of the mutilating and often fatal accidents caused by the horizontal rollers used for breaking the flax straw prior to scutching. He refers to intemperance — 'the farmers often bringing whiskey with them to treat the workers and scutchers — the latter being proverbial for hard drinking, as the dust and close atmosphere induce thirst'. Appended too is a condemnation of

the housing of the poor with detailed and precise recommendations by Dr Robert H Newett, the certifying factory surgeon in Ligoniel. These predecessors of ours were dedicated, hard-working, observant and caring men to whom not enough credit is given for their work in ameliorating the effects of the factory system.

C D Purdon died in 1882 aged 64 after two days' illness. His obituary notice in the British Medical Journal occupies only 14 lines. His motivation, like Malcolm's, was that not only of the scientific researcher but also of the compassionate physician. He was succeeded as Certifying Factory Surgeon by his son H S Purdon whose classic account of the linen trade and its processes is recorded in Sir Thomas Oliver's massive work *Dangerous trades*.¹⁹ His interest in respiratory disease was manifest in his appointment as one of the original physicians to the first specialist chest hospital in Belfast — the Forster Green Hospital. As if this were not sufficient outlet for his energies, in 1875 he published a treatise on cutaneous medicine and diseases of the skin and for some years was editor of the *Journal of Cutaneous Medicine*.

Malthus had enunciated his theory of population in 1798 which was held to justify the *laissez-faire* policies of later Victorian Britain. Darwin propounded his theories in 1859 which were interpreted by many as 'every man for himself and the devil take the hindmost'. In spite of the prevailing philosophies of the times, we can look back with pride to many of our forbears. As a result of the interest, the compassion and the indefatigable energy of that mid-Victorian generation of 'medical gentlemen' in all parts of the kingdom, the traditions to which each member of our profession is heir, were established. In that profession, occupational medicine is a vocation which beckons to it technically good doctors, generous in their sympathies, liberal in their sentiments and courageous when, as sometimes happens, they are misunderstood by those whom they serve.

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